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structure of the Cretaceous rocks was determined more completely, and, as it has important economic bearings in connection with artesian water, a special sheet is devoted to its presentation. In a plaster model the upper surface of the Dakota sandstone was restored so as to exhibit its flexures and faults, and a lithographic plate was prepared from a photograph of this model. The general trend of the flexures is NNW, and the faults have the same course.

The flex rocks have been subjected to erosion during a large part of Tertiary time, with the result that the relief expresses the principal facts of structure with great fidelity. Inclined outcrops of the resistant Dakota sandstone form monoclinical ridges from 600 to 1,200 feet in height. A limestone at the base of the Niobrara formation is exposed in a system of sloping plains, mesas and ridges, which the details of structure render somewhat complex. The outcrop of another limestone is marked through a wide range of territory by a characteristic terrace, and other terraces are determined by Neocene and Pleistocene alluvial formations.

Among the economic materials are sandstones available for structural purposes, limestones available for lime, and flux, gypsum and fire-clay. Artesian water, contained in the Dakota sandstone, underlies nine-tenths of the quadrangle, and the structural relations indicate that in about one-sixth of the quadrangle the head is sufficient to carry it to the surface. A special map indicates its distribution, showing separately the flowing and pumping areas and indicating by contours the estimated depth of the water below the surface of the ground.

The text is adjusted to the needs of lay readers; technical language is avoided, so far as may be, and where avoidance is impracticable the terms used are explained.

SOCIETIES AND ACADEMIES.

BIOLOGICAL SOCIETY OF WASHINGTON, 236TH MEETING, SATURDAY, JANUARY 29.

MR. WILLIAM PALMER read a paper on the Birds of the Pribilof Islands, Alaska, stating that 69 species were known from that locality. Of these, 18, mostly stragglers, are American,

28 are exclusively Pacific, 17 are circumpolar and but 6 Asiatic. None of the Asiatic species breed on the islands, and but one of the American species. Seventeen of the Pacific forms and four of the circumpolar, however, breed on the Pribilofs. With the exception of eleven land birds, four of which are common and breed, the entire avifauna is composed of water birds and waders. Thousands of birds pass southwards through the Aleutian Islands during the autumnal migration to their winter homes on the coast of Asia. Others journey direct to the Hawaiian and other islands of the Middle and South Pacific, thus making the longest trans-oceanic journeys known to be made by birds.

Dr. L. O. Howard presented, under the title 'The European hornet in America,' some brief notes about *Vespa crabro*. He exhibited specimens of the larva and pupa of this insect taken by Dr. E. G. Love from a nest found near Jamaica, Long Island. He also showed photographs of the nest, both in longitudinal and horizontal section. He showed that this insect has been present in this country in the vicinity of New York City certainly since 1848, but that during that time it has spread less than 150 miles from its point of introduction, the most distant point at which it has certainly been found being Anglesea, N. J. Reported occurrences in Maryland and North Carolina were considered doubtful by the speaker. He further called attention to the fact that, while in Europe the species usually inhabits outhouses, in this country its nests have almost invariably been found in hollow trees.

F. A. LUCAS,
Secretary.

THE ACADEMY OF SCIENCE OF ST. LOUIS.

AT the meeting of the Academy of Science of January 17, 1898, seventeen persons present, a paper by Charles Robertson, entitled 'New or Little Known North American Bees,' was read in abstract and referred to the Council for publication. Dr. A. C. Bernays addressed the Academy on biological facts as evidence of man's place in nature. He illustrated certain facts from the ontogeny of man by description and blackboard sketches, and tried to explain the anatomical peculiarities in the structure of

man and the lower animals by the biogenetic law of Haeckel. He also made some suggestions about the best method of studying and of teaching anatomy. It was claimed that in the biogenetic law of Haeckel a scientific background, or rather a working hypothesis, was given, by means of which the recorded facts of zoology, botany, paleontology, etc., were made understandable and really became useful to science. He also gave a definition and illustration of the meaning of the term differentiation as used in biology.

Three new members were elected.

At the meeting of February 7, 1898, fourteen persons present, a paper by Professor A. S. Hitchcock, on the ecological plant geography of Kansas, was presented and referred to the Council for publication. Professor L. H. Pammel spoke on the anatomical characters of seeds from the standpoint of systematic botany, presenting in abstract the results of an extensive study of the subject, on which he has been engaged for some years past.

Twenty-four new members were elected.

WILLIAM TRELEASE,
Recording Secretary.

AMERICAN CHEMICAL SOCIETY.

THE regular meeting of the New York Section of the American Chemical Society was held on Friday evening, February 4th. Dr. Wm. McMurtrie presided, and seventy-two members and visitors were present.

The chairman opened the meeting with a very interesting surprise in the announcement that he had just received a half-gallon of liquid air from Mr. Tripler, and the first half-hour was occupied in an exhibition of its properties.

The liquid was ladled out of a covered receptacle packed in several thicknesses of felt, very much as if it had been ordinary ice water, but on pouring it into any glass, porcelain or iron vessel it boiled with great violence until the container cooled to the temperature of the intensely cold liquid, which means about -310° F.

Drops falling on the lecture table immediately took the spheroidal form and ran about exactly as drops of water on a hot stove. Placed in a glass beaker the liquid first boiled, then became clouded with a crystalline precipi-

tate of carbon dioxide, which was present as an impurity, and from which it was separated by filtration through an ordinary paper filter, and the clear liquid was caught in a double-walled glass cylinder. The space between the walls, having been exhausted, to produce a vacuum, the clear, slightly blue liquid air remained in the tube for over an hour before complete evaporation. Among other experiments, alcohol was quickly frozen, rubber tubing was hardened by the low temperature so as to break when struck by a hammer almost like glass, and a piece of thin sheet iron, after immersion in the cold liquid, became very brittle.

The following papers were read: 'Determination of Boric Acid,' T. S. Gladding; 'Recent Progress in the Chemistry of the Leather Industry,' J. H. Yocum; 'Review of Chemical and Physical Methods for Examining Documents and Handwriting,' C. A. Doremus.

The next meeting will be held on March 11th.

DURAND WOODMAN,
Secretary.

NEW BOOKS.

Text-Book of Zoology. T. JEFFERY PARKER and WILLIAM A. HASWELL. London and New York, The Macmillan Company. 1897. Vol. I., pp. xxxv + 779. Vol. II., pp. xx + 683. \$9.00.

Lehrbuch der Entwicklungsgeschichte des Menschen. J. KOLLMANN. Jena, Gustav Fischer. 1896. Pp. xii + 658. 15 Marks.

Organographie der Pflanzen. K. GOEBEL. 1st Part, *Allgemeine Organographie.* Jena, Gustav Fischer. 1898. Pp. ix + 232. 6 Marks.

Laboratory Experiments on the Class Reactions and Identification of Organic Substances. ARTHUR A. NOYES and SAMUEL P. MULLIKEN. Easton, Pa., Chemical Publishing Co. 1897. Pp. 28. 50 cts.

The Freezing Point, Boiling Point and Conductivity Methods. HARRY C. JONES. Easton, Pa., Chemical Publishing Co. 1897. Pp. vii + 64. 75 cts.

Garden Making. L. H. BAILEY. New York and London, The Macmillan Company. 1898. Pp. vii + 417. \$1.00.